

CPE 321 – Lab 1: Historical Ciphers

1) **Filename:** caesar_easy_encrypted.txt

a. Encryption Key: 8

b. Decrypted Text:

Scrooge took his melancholy dinner in his usual melancholy tavern; and having read all the newspapers, and beguiled the rest of the evening with his banker's-book, went home to bed. He lived in chambers which had once belonged to his deceased partner. They were a gloomy suite of rooms, in a lowering pile of building up a yard, where it had so little business to be, that one could scarcely help fancying it must have run there when it was a young house, playing at hide-and-seek with other houses, and forgotten the way out again. It was old enough now, and dreary enough, for nobody lived in it but Scrooge, the other rooms being all let out as offices. The yard was so dark that even Scrooge, who knew its every stone, was fain to grope with his hands. The fog and frost so hung about the black old gateway of the house, that it seemed as if the Genius of the Weather sat in mournful meditation on the threshold.

c. Process: Brute Forced keys ranging from 0 to 25 onto the text. Printed all text onto the terminal.

d. Code:

```
import sys

def incUpper(char, key):
    newOrd = ord(char) + key
    if (newOrd > ord('Z')):
        newOrd -= 26
    return chr(newOrd)

def incLower(char, key):
    newOrd = ord(char) + key
    if (newOrd > ord('z')):
        newOrd -= 26
    return chr(newOrd)

def writeWithKey(key, line):
    for char in line:
        newChar = '/'
        if char.isupper():
            newChar = incUpper(char, key)
        elif char.islower():
            newChar = incLower(char, key)
        else:
            newChar = char
        sys.stdout.write(newChar)

def cycleKey(key):
    fileName = sys.argv[1]
    file = open(fileName)
    print("Key " + str(26 - key) + ": ")
    for line in file:
        writeWithKey(key, line)
    print("\n")
    file.close()
```

```
def main():
    key = 0
    while (key != 26):
        cycleKey(key)
        key += 1

if __name__ == '__main__':
    main()
```

2) **Filename:** caesar_easy_2_encrypted.txt

a. Encryption Key: 15

b. Decrypted Text:

One of the phenomena which had peculiarly attracted my attention was the structure of the human frame, and, indeed, any animal endued with life. Whence, I often asked myself, did the principle of life proceed? It was a bold question, and one which has ever been considered as a mystery; yet with how many things are we upon the brink of becoming acquainted, if cowardice or carelessness did not restrain our inquiries. I revolved these circumstances in my mind and determined thenceforth to apply myself more particularly to those branches of natural philosophy which relate to physiology. Unless I had been animated by an almost supernatural enthusiasm, my application to this study would have been irksome and almost intolerable. To examine the causes of life, we must first have recourse to death. I became acquainted with the science of anatomy, but this was not sufficient; I must also observe the natural decay and corruption of the human body. In my education my father had taken the greatest precautions that my mind should be impressed with no supernatural horrors. I do not ever remember to have trembled at a tale of superstition or to have feared the apparition of a spirit. Darkness had no effect upon my fancy, and a churchyard was to me merely the receptacle of bodies deprived of life, which, from being the seat of beauty and strength, had become food for the worm. Now I was led to examine the cause and progress of this decay and forced to spend days and nights in vaults and charnel-houses. My attention was fixed upon every object the most insupportable to the delicacy of the human feelings. I saw how the fine form of man was degraded and wasted; I beheld the corruption of death succeed to the blooming cheek of life; I saw how the worm inherited the wonders of the eye and brain. I paused, examining and analysing all the minutiae of causation, as exemplified in the change from life to death, and death to life, until from the midst of this darkness a sudden light broke in upon me—a light so brilliant and wondrous, yet so simple, that while I became dizzy with the immensity of the prospect which it illustrated, I was surprised that among so many men of genius who had directed their inquiries towards the same science, that I alone should be reserved to discover so astonishing a secret.

c. Process: Brute Forced keys ranging from 0 to 25 onto the text. Printed all text onto the terminal. Pasted the excerpt from Project Gutenberg.

d. Code: Same as #1 -- caesar_easy_encrypted.txt

3) **Filename:** caesar_hard_encrypt.txt**a. Encryption Key:** 20**b. Decrypted Text:**

But this is not a claim that Man should stay always youthful. Supposing that that famous Spaniard, landing upon Florida's coral strands, had found that mythical Fountain of Youth; what a calamity for mankind! A world without maturity of thought; without man's full-grown muscular ability to construct mighty buildings, railroads and ships; a world without authors, doctors, savants, musicians; nothing but Youth! I can think of but a solitary approval of such a condition; for such a horror as war would not,—could not occur; for a child is, naturally, a small bunch of sympathy. I know that boys will "scrap;" also that "spats" will occur amongst girls; but, at such a monstrosity as killings by bombing towns, sinking ships, or mass annihilation of marching troops, childhood would stand aghast. Not a tiny bird would fall; nor would any form of gun nor facility for manufacturing it, insult that almost Holy purity of youthful thought. Anybody who knows that wracking sorrow brought upon a child by a dying puppy or cat, knows that childhood can show us that our fighting, our policy of "a tooth for a tooth," is abominably wrong.

c. Process: Brute Forced keys ranging from 0 to 25 onto the text. Printed all text onto the terminal.**d. Code:** Same as #1 -- caesar_easy_encrypted.txt4) **Filename:** caesar_hard_2_encrypt.txt**a. Encryption Key:** 3**b. Decrypted Text:**

As Gadsby sat thinking thus, his plan was rapidly growing; and, in a month, was actually starting to work. How? You'll know shortly; but first, you should know this John Gadsby; a man of "around fifty;" a family man, and known throughout Branton Hills for his high standard of honor and altruism on any kind of an occasion for public good. A loyal churchman, Gadsby was a man who, though admitting that an occasional fault in our daily acts is bound to occur, had taught his two boys and a pair of girls that, though folks do slip from what Scriptural authors call that "straight and narrow path," it will not pay to risk your own Soul by slipping, just so that you can laugh at your ability in staying out of prison; for Gadsby, having grown up in Branton Hills, could point to many such man or woman. So, with such firm convictions in his mind, this upstanding man was constantly striving so to act that no complaint from man, woman or child should bring a word of disapproval. In his mind, what a man might do was that man's affair only and could stain no Soul but his own. And his altruism taught that it is not difficult to find many ways in which to bring joy to such as cannot, through physical disability, go out to look for it; and that only a small bit of joy, brought to a shut-in invalid will carry with it such a warmth as can flow only from acts of human sympathy.

c. Process: Brute Forced keys ranging from 0 to 25 onto the text. Printed all text onto the terminal. Pasted excerpt from Gutenberg.**d. Code:** Same as #1 -- caesar_easy_encrypted.txt

5) Filename: mono_easy_encrypt.txt**a. Encryption Key:** W E V Y Z S R X N L T I K G C J P D O M F * U H B A**b. Decrypted Text:**

MEGALONYX

MEGALONYX (GREAT CLAW) IS THE GREEK NAME FOR ANOTHER OF THE GIANT GROUND SLOTHS. THE NAME WAS PROPOSED BY THOMAS JEFFERSON IN 1797, BASED ON FOSSIL SPECIMENS FOUND IN A CAVE IN WEST VIRGINIA. MEGALONYX JEFFERSONII, OF THE FAMILY MEGALONYCHIDAE, WAS A LARGE, HEAVILY BUILT ANIMAL ABOUT 8 TO 10 FEET (2.53 M) LONG. ITS MAXIMUM WEIGHT MAY HAVE BEEN AS MUCH AS 800 POUNDS. THIS IS MEDIUM-SIZED AMONG THE GIANT GROUND SLOTHS.

LIKE OTHER GROUND SLOTHS IT HAD A BLUNT SNOUT, MASSIVE JAW AND LARGE, PEG-LIKE TEETH. THE HIND LIMBS WERE PLANTIGRADE (FLAT-FOOTED) AND THIS, ALONG WITH ITS STOUT TAIL, ALLOWED IT TO REAR UP INTO A SEMI-ERECT POSITION TO FEED ON TREE LEAVES. THE FORELIMBS HAD THREE HIGHLY DEVELOPED CLAWS THAT WERE PROBABLY USED TO STRIP LEAVES AND TEAR OFF BRANCHES.

M. JEFFERSONII WAS APPARENTLY THE MOST WIDE-RANGING GIANT GROUND SLOTH. FOSSILS ARE KNOWN FROM MANY PLEISTOCENE SITES IN THE UNITED STATES, INCLUDING MOST OF THE STATES EAST OF THE ROCKY MOUNTAINS AS WELL AS ALONG THE WEST COAST. IT WAS THE ONLY GROUND SLOTH TO RANGE AS FAR NORTH AS THE PRESENT-DAY YUKON AND ALASKA.

IN 2010, THE FIRST SPECIMEN EVER FOUND IN COLORADO WAS DISCOVERED AT THE ZIEGLER RESERVOIR SITE NEAR SNOWMASS VILLAGE (IN THE ROCKY MOUNTAINS AT AN ELEVATION OF 8,874 FEET). WHY THE GIANT GROUND SLOTH, AS WITH OTHER MEGAFAUNA OF THE MIOCENE EPOCH, GREW TO SUCH ENORMOUS SIZE IS A MYSTERY.

BESIDES THEIR BULK, THESE SLOTHS WERE DISTINGUISHED BY THEIR SIGNIFICANTLY LONGER FRONT THAN HIND LEGS, A CLUE THAT THEY USED THEIR LONG FRONT CLAWS TO ROPE IN COPIOUS AMOUNTS OF VEGETATION. AS BIG AS IT WAS, THOUGH, MEGALONYX WAS A MERE PUP COMPARED TO THE TRULY GIANT MEGATHERIUM.

MEGATHERIUM AND MEGALONYX ARE DISTANT RELATIVES OF TODAY'S MODERN TWO- AND THREE-FINGERED SLOTHS THAT LIVE IN CENTRAL AND SOUTH AMERICA.

c. Process: Utilized the dictionary data structure in python and reran the program – making edits to the dictionary as I saw patterns. Eventually ended up with a working dictionary and the decrypted text was from the terminal.

d. Code:

```
import sys
```

```
alphas = {
    'a' : 'W',
```

```
        'b' : 'E',
        'c' : 'V',
        'd' : 'Y',
        'e' : 'Z',
        'f' : 'S',
        'g' : 'R',
        'h' : 'X',
        'i' : 'N',
        'j' : 'L',
        'k' : 'T',
        'l' : 'I',
        'm' : 'K',
        'n' : 'G',
        'o' : 'C',
        'p' : 'J',
        'q' : 'P',
        'r' : 'D',
        's' : 'O',
        't' : 'M',
        'u' : 'F',
        'v' : 'v',
        'w' : 'U',
        'x' : 'H',
        'y' : 'B',
        'z' : 'A'
    }

def printFromDict(char):
    if not char.isalpha():
        return char

    lowerChar = alphas[char.lower()]
    return lowerChar

def main():
    fileName = sys.argv[1]
    file = open(fileName)
    for line in file:
        for char in line:
            sys.stdout.write(printFromDict(char))
    file.close()

if __name__ == '__main__':
    main()
```

6) **Filename:** mono_medium_encrypt.txt

a. **Encryption Key:** W E V Y Z S R X N L T I K G C J P D O M F * U H B A

b. **Decrypted Text:**

TWAS BRILLIG, AND THE SLITHY TOVES
DID GYRE AND GIMBLE IN THE WABE:
ALL MIMSY WERE THE BOROGOVES,
AND THE MOME RATHS OUTGRABE.

BEWARE THE JABBERWOCK, MY SON!
THE JAWS THAT BITE, THE CLAWS THAT CATCH!
BEWARE THE JUBJUB BIRD, AND SHUN
THE FRUMIOUS BANDERSNATCH!

HE TOOK HIS VORPAL SWORD IN HAND;
LONG TIME THE MANXOME FOE HE SOUGHT
SO RESTED HE BY THE TUMTUM TREE
AND STOOD AWHILE IN THOUGHT.

AND, AS IN UFFISH THOUGHT HE STOOD,
THE JABBERWOCK, WITH EYES OF FLAME,
CAME WHIFFLING THROUGH THE TULGEY WOOD,
AND BURBLED AS IT CAME!

ONE, TWO! ONE, TWO! AND THROUGH AND THROUGH
THE VORPAL BLADE WENT SNICKER-SNACK!
HE LEFT IT DEAD, AND WITH ITS HEAD
HE WENT GALUMPHING BACK.

AND HAST THOU SLAIN THE JABBERWOCK?
COME TO MY ARMS, MY BEAMISH BOY!
O FRABJOUS DAY! CALLOOH! CALLAY!
HE CHORTLED IN HIS JOY.

TWAS BRILLIG, AND THE SLITHY TOVES
DID GYRE AND GIMBLE IN THE WABE:
ALL MIMSY WERE THE BOROGOVES,
AND THE MOME RATHS OUTGRABE.

c. **Process:** Created a new dictionary to count the letters. Assigned E and T the two top-most used letters. Found the word 'the'. Slowly found more words. Then noticed it was the Jabberwock poem. Looked up the poem, and finished the cipher.

d. **Code:** Same as #5 -- mono_easy_encrypt.txt. Except I added a new dictionary and print statement:

```
counts = {
    'a' : 0,
    'b' : 0,
    'c' : 0,
```

```
'd' : 0,  
'e' : 0,  
'f' : 0,  
'g' : 0,  
'h' : 0,  
'i' : 0,  
'j' : 0,  
'k' : 0,  
'l' : 0,  
'm' : 0,  
'n' : 0,  
'o' : 0,  
'p' : 0,  
'q' : 0,  
'r' : 0,  
's' : 0,  
't' : 0,  
'u' : 0,  
'v' : 0,  
'w' : 0,  
'x' : 0,  
'y' : 0,  
'z' : 0  
}  
  
# In main() after the file close  
for entry in counts:  
    print(entry + " : " + str(counts[entry]))
```

**** Did Not Attempt the Rest ****